RUST GEOTECH INC.

Spectral Gamma-Ray Borehole
Log Data Report

Borehole 51-01-08

Log Event A

Borehole Information

Farm : TX	**Tank :** TX-101	**Site Number :** 299-W15-169
N-Coord : 41,615	**W-Coord :** 75,780	**TOC Elevation :** 672.12
Water Level, ft :	**Date Drilled :** 4/30/1974	

Casing Record

Type : Steel-welded	Thickness : 0.280	ID, in. : 6
Top Depth, ft. : 0	Bottom Depth, ft. : 100	

Borehole Notes:
According to the driller's records, this borehole was not perforated or grouted. The casing thickness is presumed to be 0.280 in., on the basis of published thickness for schedule-40, 6-in. steel tubing.

Equipment Information

Logging System : 1	**Detector Type :** HPGe	**Detector Efficiency:** 35.0 %
Calibration Date : 10/1995	**Calibration Reference :** GJPO-HAN-3	**Logging Procedure :** P-GJPO-1783

Log Run Information

Log Run Number : 1	**Log Run Date :** 12/29/1995	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 0.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 20.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 2	**Log Run Date :** 1/2/1996	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 98.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 40.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

Log Run Number : 3	**Log Run Date :** 1/10/1996	**Logging Engineer:** Bob Spatz
Start Depth, ft.: 41.0	**Counting Time, sec.:** 100	**L/R :** L **Shield :** N
Finish Depth, ft. : 19.0	**MSA Interval, ft. :** 0.5	**Log Speed, ft/min.:** n/a

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Analysis Information

Analyst : P.D. Henwood

Data Processing Reference : P-GJPO-1787 Analysis Date : 8/12/1996

Analysis Notes :

This borehole was logged by the SGLS in three logging runs. The pre-survey field verification spectrum for logging run 1 and the pre- and post-survey spectra for logging run 3 did not pass the acceptance criteria established for the peak shape and detector efficiency. A Nonconformance Report issued in August 1996 (N-96-05) identified this failure to be caused by a power supply malfunction that resulted in a low detector bias voltage being supplied to the logging tool. This malfunction occurred in the mornings because of inadequate system warm-up time. The report also documented that concentrations calculated from data collected in the first 2 hours of logging could be systematically underestimated by about 10 percent. Therefore, the data from 0 to 20 ft for log run 1 and from 19 to 41 ft for log run 3 may show a repeatability problem upon relogging the borehole. The post-survey field verification spectrum for log run 1 passed the acceptance criteria, providing evidence the logging system was operating appropriately after an initial warm-up time. Both the pre- and post-survey spectra for log run 2 passed the acceptance criteria, indicating proper system performance. Corrections for gain drifts during data collection were not necessary during processing of the data to maintain proper peak identification.

The energy calibration and peak-shape calibration from verification spectra that successfully met the acceptance criteria were used to establish the channel-to-energy parameters used in processing the spectra acquired during the logging operation.

Casing-correction factors for a 0.280-in.-thick steel casing were applied during analysis.

Depth overlaps, where data were collected by separate logging runs over the same depth interval, occurred in this borehole between depths of 19 and 20 ft and between depths of 40 and 41 ft. The concentrations of Cs-137 and of the natural radionuclides (K-40, U-238, and Th-232) were calculated using both the original and repeated log data sets at the overlapping points. The calculated concentrations of these isotopes using the separate data sets were within the statistical uncertainty of the measurements, indicating very good repeatability of the radionuclide concentration measurements. Cs-137, processed U-238, and processed U-235 were the only man-made radionuclides identified in this borehole. The presence of Cs-137 was measured almost continuously from the ground surface to about 34 ft, at 40.5 ft, and at the bottom of the borehole. The Cs-137 concentrations were about 2 pCi/g or less.

Processed U-238 was measured at 75 ft in depth with a maximum concentration of 29 pCi/g. Processed U-235 was identified at the same depth location with a maximum concentration of about 3 pCi/g.

Additional information and interpretations of log data are included in the main body of the Tank Summary Data Report for tank TX-101.

Log Plot Notes:

Separate log plots show the man-made (e.g., Cs-137) and the naturally occurring radionuclides (e.g., K-40, U-238, and Th-232). The natural radionuclides can be used for lithology interpretations. The headings of the plots identify the specific gamma rays used to calculate the concentrations.

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A combination plot includes both the man-made and natural radionuclides, in addition to the total gamma derived from the spectral data and the Tank Farms gross gamma log. The gross gamma plot displays the latest available digital data. No attempt has been made to adjust the depths of the gross gamma logs to coincide with the SGLS data.

Uncertainty bars on the plots show the statistical uncertainties for the measurements as 95-percent confidence intervals. Open circles on the plots give the MDL. The MDL of a radionuclide represents the lowest concentration at which positive identification of a gamma-ray peak is statistically defensible.